What is Claimed is:

1. A powder batch comprising photoluminescent phosphor particles, wherein said particles have a weight average particle size of from about 0.1 μm to about 10 μm and have a substantially spherical morphology, wherein at least about 80 weight percent of said particles are not larger than two times said average particle size.

2. A powder batch as recited in Claim 1, wherein said particles have a weight average particle size of from about 0.3 μm to about 5 μm.

3. A powder batch as recited in Claim 1, wherein said particles comprise Y_2O_3.

4. A powder batch as recited in Claim 3, wherein said particles further comprise a dopant selected from the group consisting of Eu, Tb and combinations thereof.

5. A powder batch as recited in Claim 1, wherein said particles comprise $(Y,Gd)BO_3$.

6. A powder batch as recited in Claim 5, wherein said particles further comprise Eu.

7. A powder batch as recited in Claim 1, wherein said particles comprise Zn_2SiO_4.

8. A powder batch as recited in Claim 7, wherein said particles further comprise Mn.

9. A powder batch as recited in Claim 1, wherein said particles comprise $BaMgAl_XO_Y$.

10. A powder batch as recited in Claim 9, wherein said particles further comprise a dopant selected from the group consisting of Mn and Eu.

11. A powder batch as recited in Claim 1, wherein said particles comprise $BaAl_XO_Y$:Mn.

12. A powder batch as recited in Claim 1, wherein at least about 90 weight percent of said particles are not larger than about two times said average particle size.

13. A powder batch as recited in Claim 1, wherein said particles comprise crystallites having an average crystallite size of at least about 25 nanometers.

14. A powder batch comprising Y_2O_3 phosphor particles, wherein said particles have a weight average particle size of from about 0.1 μm to about 10 μm and have a substantially spherical morphology, wherein at least about 80 weight percent of said particles are not larger than two times said average particle size.

15. A powder batch as recited in Claim 14, wherein said particles have a weight average particle size of from about 0.3 μm to about 5 μm.

16. A powder batch as recited in Claim 14, wherein said particles comprise a dopant selected from the group consisting of Eu, Tb and combinations thereof.

17. A powder batch as recited in Claim 16, wherein said particles have a Eu concentration of from about 6 to about 9 atomic percent.

18. A powder batch as recited in Claim 16, wherein said particles have a Eu concentration of from about 4 to about 6 atomic percent.

19. A powder batch as recited in Claim 14, wherein said particles comprise crystallites having an average crystallite size of at least about 25 nanometers.

20. A powder batch comprising $(Y,Gd)BO_3$ phosphor particles, wherein said particles have a weight average particle size of from about 0.1 μm to about 10 μm and have a substantially spherical morphology, wherein at least about 80 weight percent of said particles are not larger than two times said average particle size.

21. A powder batch as recited in Claim 20, wherein said particles have a weight average particle size of from about 0.3 μm to about 5 μm.

22. A powder batch as recited in Claim 20, wherein said particles comprise Eu as a dopant.

23. A powder batch as recited in Claim 22, wherein said particles have a Eu concentration of from about 14 to about 20 atomic percent.

24. A powder batch as recited in Claim 20, wherein said particles comprise crystallites having an average crystallite size of at least about 25 nanometers.

25. A powder batch comprising Zn_2SiO_4 phosphor particles, wherein said particles have a weight average particle size of from about 0.1 μm to about 10 μm and have a substantially spherical morphology, wherein at least about 80 weight percent of said particles are not larger than two times said average particle size.

26. A powder batch as recited in Claim 25, wherein said particles have a weight average particle size of from about 0.3 μm to about 5 μm.

27. A powder batch as recited in Claim 25, wherein said particles comprise Mn as a dopant.

28. A powder batch as recited in Claim 27, wherein said particles have a Mn concentration of from about 0.05 to about 2 atomic percent.

29. A powder batch as recited in Claim 25, wherein said particles comprise Zn_2SiO_4 and SiO_2.

30. A powder batch as recited in Claim 25, wherein said particles comprise Zn_2SiO_4 crystallites having an average crystallite size of at least about 25 nanometers.

31. A powder batch comprising $BaMgAl_XO_Y$ phosphor particles, wherein said particles have a weight average particle size of from about 0.1 μm to about 10 μm and have a substantially spherical morphology, wherein at least about 80 weight percent of said particles are not larger than two times said average particle size.

32. A powder batch as recited in Claim 31, wherein said particles have a weight average particle size of from about 0.3 μm to about 5 μm.

33. A powder batch as recited in Claim 31, wherein said particles comprise a dopant selected from the group consisting of Eu and Mn.

34. A powder batch as recited in Claim 33, wherein said particles comprise Eu in an amount of from about 6 to about 12 atomic percent.

35. A powder batch as recited in Claim 31, wherein said particles comprise $BaMgAl_XO_Y$ and Al_2O_3.

36. A powder batch as recited in Claim 31, wherein said particles comprise $BaMgAl_{10}O_{17}$.

37. A powder batch as recited in Claim 31, wherein said particles comprise $BaMgAl_xO_y$ crystallites having an average crystallite size of at least about 25 nanometers.

38. A powder batch comprising $BaAl_XO_Y$ phosphor particles, wherein said particles have a weight average particle size of from about 0.1 μm to about 10 μm and have a substantially spherical morphology, wherein at least about 80 weight percent of said particles are not larger than two times said average particle size.

39. A powder batch as recited in Claim 38, wherein said particles have a weight average particle size of from about 0.3 μm to about 5 μm.

40. A powder batch as recited in Claim 38, wherein said particles comprise Mn as a dopant.

41. A powder batch as recited in Claim 38, wherein said particles comprise $BaAl_xO_y$ crystallites having an average crystallite size of at least about 25 nanometers.

42. A flowable medium suitable for applying photoluminescent phosphor particles onto a substrate, comprising:

a) a liquid vehicle phase; and

b) a functional phase dispersed throughout said vehicle phase, said functional phase comprising photoluminescent phosphor particles, wherein said phosphor particles are substantially spherical and have a weight average particle size of not greater than about 5 μm.

43. A flowable medium as recited in Claim 42, wherein said phosphor particles have a particle size distribution wherein at least about 80 weight percent of said phosphor particles are not larger than two times said average particle size.

44. A flowable medium as recited in Claim 42, wherein said vehicle phase is an aqueous-based solution.

45. A flowable medium as recited in Claim 42, wherein said vehicle phase is an aqueous-based solution comprising a dispersing agent.

46. A flowable medium as recited in Claim 42, wherein said flowable medium comprises from about 5 to about 95 weight percent of said phosphor particles.

47. A flowable medium as recited in Claim 42, wherein said flowable medium comprises from about 50 to about 85 weight percent of said phosphor particles.

48. A flowable medium as recited in Claim 42, wherein said phosphor particles comprise Y_2O_3.

49. A flowable medium as recited in Claim 42, wherein said phosphor particles comprise $BaMgAl_XO_Y$.

50. A flowable medium as recited in Claim 42, wherein said phosphor particles comprise $BaAl_XO_Y$.

51. A flowable medium as recited in Claim 42, wherein said phosphor particles comprise $(Y,Gd)BO_3$.

52. A flowable medium as recited in Claim 42, wherein said phosphor particles comprise Zn_2SiO_4.

53. A flowable medium as recited in Claim 42, wherein said liquid vehicle comprises isopropanol.

54. A paste composition suitable for applying phosphor particles onto a substrate, comprising:

a) a liquid vehicle phase; and

b) a functional phase dispersed throughout said vehicle phase, said functional phase comprising photoluminescent phosphor particles having a weight average particle size of not greater than about 5 μm and a particle size distribution wherein at least about 80 weight percent of said particles are not larger than two times said average particle size.

55. A paste composition as recited in Claim 54, wherein said phosphor particles have a substantially spherical morphology.

56. A paste composition as recited in Claim 54, wherein said phosphor particles comprise Y_2O_3.

57. A paste composition as recited in Claim 54, wherein said phosphor particles comprise $BaMgAl_XO_Y$.

58. A paste composition as recited in Claim 54, wherein said phosphor particles comprise $BaAl_XO_Y$.

59. A paste composition as recited in Claim 54, wherein said phosphor particles comprise $(Y,Gd)BO_3$.

60. A paste composition as recited in Claim 54, wherein said phosphor particles comprise Zn_2SiO_4.

61. A paste composition as recited in Claim 54, wherein said phosphor particles comprise crystallites having an average crystallite size of at least about 25 nanometers.

62. A photoluminescent device comprising:

a) an excitation source; and

b) at least a first layer of photoluminescent phosphor particles adapted to be stimulated by said excitation source, wherein said phosphor particles have a weight average particle size of from about 0.1 μm to about 10 μm, a substantially spherical morphology and wherein at least about 80 weight percent of said particles are not larger than two times said average particle size.

63. A photoluminescent device as recited in Claim 62, wherein said phosphor particles have an average size of from about 0.3 μm to about 5 μm.

64. A photoluminescent device as recited in Claim 62, wherein said excitation source comprises a gas and wherein said gas comprises xenon.

65. A photoluminescent device as recited in Claim 62, wherein said excitation source comprises a gas and wherein said gas comprises mercury.

66. A photoluminescent device as recited in Claim 62, wherein said particles comprise Y_2O_3:Eu.

67. A photoluminescent device as recited in Claim 62, wherein said particles comprise $(Y,Gd)BO_3$:Eu.

68. A photoluminescent device as recited in Claim 62, wherein said particles comprise Zn_2SiO_4:Mn.

69. A photoluminescent device as recited in Claim 62, wherein said particles comprise $BaMgAl_XO_Y$:Eu.

70. A photoluminescent device as recited in Claim 62, wherein said particles comprise $BaAl_XO_Y$.

71. A photoluminescent device as recited in Claim 62, wherein said particles comprise $BaMgAl_XO_Y$:Mn.

72. A photoluminescent device as recited in Claim 62, wherein said layer is a substantially uniform layer of photoluminescent phosphor particles, said layer having an average thickness of not greater than about three times said average particle size.

73. A photoluminescent device as recited in Claim 62, wherein said device is a plasma display panel.

74. A photoluminescent device as recited in Claim 62, wherein said device is a fluorescent lamp.

75. A photoluminescent device as recited in Claim 62, wherein said device is an LCD backlight.

76. A plasma display panel, comprising:

a) a rear panel comprising a plurality of row electrodes;

b) a front panel comprising a plurality of column electrodes, wherein said row electrodes and said column electrodes are in perpendicular relation to form a plurality of addressable x-y coordinates;

c) a photoluminescent phosphor powder dispersed on a substrate disposed between said electrodes, wherein said phosphor powder comprises particles having a weight average particle size of not greater than about 5 μm and a particle size distribution wherein at least about 80 weight percent of said particles are not larger than two times said average particle size.

77. A plasma display panel as recited in Claim 76, wherein said particles have a substantially spherical morphology.

78. A plasma display panel as recited in Claim 76, wherein said average particle size is from about 0.3 μm to about 5 μm.

79. A plasma display panel as recited in Claim 76, wherein said particles have a particle size distribution wherein at least about 90 weight percent of said particles are not larger than about two times said weight average particle size.

80. A plasma display panel as recited in Claim 76, wherein said phosphor particles comprise crystallites having an average crystallite size of at least about 25 nanometers.

81. A plasma display panel as recited in Claim 76, wherein said phosphor powder is dispersed in a substantially uniform layer having an average thickness of not greater than about three times said average particle size.

82. A plasma display panel as recited in Claim 76, wherein said phosphor powder comprises $BaMgAl_XO_Y$:Eu.

83. A plasma display panel as recited in Claim 76, wherein said phosphor powder comprises $BaMgAl_XO_Y$ and from about 8 to about 12 atomic percent Eu and wherein said excitation source comprises xenon gas.

84. A plasma display panel as recited in Claim 76, wherein said phosphor powder comprises $BaAl_XO_Y$:Mn.

85. A plasma display panel as recited in Claim 76, wherein said phosphor powder comprises $BaAl_XO_Y$ and from about 8 to about 12 atomic percent Mn and wherein said excitation source comprises xenon gas.

86. A plasma display panel as recited in Claim 76, wherein said phosphor powder comprises Zn_2SiO_4:Mn.

87. A plasma display panel as recited in Claim 76, wherein said phosphor powder comprises Zn_2SiO_4 and from about 0.05 to about 2 atomic percent Mn and wherein said excitation source comprises xenon gas.

88. A plasma display panel as recited in Claim 76, wherein said phosphor powder comprises Y_2O_3:Eu.

89. A plasma display panel as recited in Claim 76, wherein said phosphor powder comprises Y_2O_3 and from about 4 to about 6 atomic percent Eu and wherein said excitation source comprises xenon gas.

90. A plasma display panel as recited in Claim 76, wherein said phosphor powder comprises $(Y,Gd)BO_3$:Eu.

91. A plasma display panel as recited in Claim 76, wherein said phosphor powder comprises $(Y,Gd)BO_3$ and from about 14 to about 20 atomic percent Eu and wherein said excitation source comprises xenon gas.

92. A plasma display panel as recited in Claim 76, wherein said phosphor powder comprises:

a) first phosphor particles of $BaMgAl_xO_y$:Eu;

b) second phosphor particles selected from the group consisting of Zn_2SiO_4:Mn, $BaAl_XO_Y$:Mn and mixtures thereof; and

c) third phosphor particles selected from the group consisting of Y_2O_3:Eu, $(Y,Gd)BO_3$:Eu and mixtures thereof.

93. A fluorescent lighting element, comprising:

a) an excitation source; and

b) a phosphor powder layer comprising photoluminescent phosphor particles adapted to be stimulated by said excitation source, wherein said phosphor particles have a substantially spherical morphology, a weight average particle size of from about 0.1 μm to about 10 μm and wherein at least about 80 weight percent of said particles are not larger than two times said average particle size.

94. A fluorescent lighting element as recited in Claim 93, wherein said phosphor powder layer comprises a preselected combination of phosphor particles to produce white light.

95. A fluorescent lighting element as recited in Claim 93, wherein said fluorescent lighting element is an LCD backlight.

96. A fluorescent lighting element as recited in Claim 93, wherein said excitation source comprises mercury vapor.

97. A fluorescent lighting element as recited in Claim 93, wherein said phosphor particles comprise Y_2O_3 and from about 6 to about 9 atomic percent Eu.

98. A fluorescent lighting element as recited in Claim 93, wherein said phosphor particles comprise $(Y,Gd)BO_3$ and from about 14 to about 20 atomic percent Eu.

99. A fluorescent lighting element as recited in Claim 93, wherein said phosphor particles comprise Zn_2SiO_4 and from about 0.05 to about 2 atomic percent Mn.

100. A fluorescent lighting element as recited in Claim 93, wherein said phosphor particles comprise $BaMgAl_XO_Y$ and from about 6 to about 12 atomic percent Eu.

101. A fluorescent lighting element as recited in Claim 93, wherein said excitation source comprises xenon gas.

102. An article of manufacture comprising indicia for identifying said article, wherein said indicia comprises a layer of photoluminescent phosphor particles in a predetermined pattern, wherein said phosphor particles have a substantially spherical morphology, have a weight average particle size of from about 0.3 μm to about 5 μm and wherein at least about 80 weight percent of said particles are not larger than about two times said average particle size.

103. An article of manufacture as recited in Claim 102, wherein said phosphor particles comprise Y_2O_3:Eu.

104. An article of manufacture as recited in Claim 102, wherein said phosphor particles comprise Y_2O_3 and from about 6 to about 9 atomic percent Eu.

105. An article of manufacture as recited in Claim 102, wherein said phosphor particles comprise $(Y,Gd)BO_3$:Eu.

106. An article of manufacture as recited in Claim 102, wherein said phosphor particles comprise $(Y,Gd)BO_3$ and from about 14 to about 20 atomic percent Eu.

107. An article of manufacture as recited in Claim 102, wherein said article is currency.

108. An article of manufacture as recited in Claim 102, wherein said article is a postage stamp.

109. A method for securing a document, comprising the steps of providing a document and applying photoluminescent phosphor particles on said document, wherein said phosphor particles have a weight average particle size of from about 0.1 μm to about 5 μm and a substantially spherical morphology.

110. A method as recited in Claim 109, wherein at least about 80 weight percent of said particles have a particle size that is not greater than about two times said average particle size.

111. A method as recited in Claim 109, wherein said applying step comprises dispersing said phosphor particles in a liquid medium and applying said phosphor particles to said document by ink-jet printing.

112. An method as recited in Claim 109, wherein said phosphor particles comprise Y_2O_3:Eu.

113. An method as recited in Claim 109, wherein said phosphor particles comprise Y_2O_3 and from about 6 to about 9 atomic percent Eu.

114. An method as recited in Claim 109, wherein said phosphor particles comprise $(Y,Gd)BO_3$:Eu.

115. A method as recited in Claim 109, wherein said phosphor particles comprise $(Y,Gd)BO_3$ and from about 14 to about 20 atomic percent Eu.

116. An method as recited in Claim 109, wherein said article is a confidential document.

117. A method for the production of a photoluminescent phosphor powder batch, comprising the steps of:

a) forming a liquid comprising precursors to a photoluminescent phosphor compound;

b) generating an aerosol of droplets from said liquid;

c) pyrolyzing said droplets to remove liquid therefrom and at least partially react said precursors to form intermediate precursor particles; and

d) heating said intermediate precursor particles to form a powder batch of phosphor particles.

118. A method as recited in Claim 117, wherein said liquid comprises a particulate precursor.

119. A method as recited in Claim 117, wherein said step of generating an aerosol comprises the step of ultrasonically atomizing said liquid.

120. A method as recited in Claim 117, wherein said pyrolyzing step comprises pyrolyzing said droplets at a reaction temperature of at least about 700 °C.

121. A method as recited in Claim 117, wherein pyrolyzing step comprises pyrolyzing said droplets at a reaction temperature of from about 750°C to about 950°C.

122. A method as recited in Claim 117, wherein said intermediate precursor particles have an average size of not greater than about 10 μm.

123. A method as recited in Claim 117, wherein said intermediate precursor particles have an average size of not greater than about 5 μm.

124. A method as recited in Claim 117, wherein said heating step comprises heating said intermediate precursor particles with agitation.

125. A method as recited in Claim 117, wherein said heating step comprises heating said intermediate precursor particles with sufficient agitation to substantially prevent the formation of hard agglomerates from said phosphor particles.

126. A method as recited in Claim 117, wherein said heating step comprises heating said intermediate precursor particles in a rotary kiln.

127. A method as recited in Claim 117, wherein said heating step comprises heating said intermediate precursor particles to a temperature of from about 1100 °C to about 1600°C.

128. A method as recited in Claim 117, wherein no more than about 0.1 weight percent of said phosphor particles are in the form of hard agglomerates.

129. A method as recited in Claim 117, wherein said phosphor particles have a weight average particle size of not greater than about 5 μm and wherein said particles have not been milled to remove hard agglomerates.

130. A method as recited in Claim 117, further comprising the step of lightly dispersing said particles to remove soft agglomerates.

131. A method for the production of a Y_2O_3 phosphor powder batch, comprising the steps of:

a) forming a liquid solution comprising precursors to a Y_2O_3 phosphor compound;

b) generating an aerosol of droplets from said liquid solution;

c) pyrolyzing said droplets to remove liquid therefrom and at least partially react said precursors to form intermediate precursor particles; and

d) heating said intermediate precursor particles to form a powder batch of phosphor particles.

132. A method as recited in Claim 131, wherein said step of generating an aerosol comprises the step of ultrasonically atomizing said liquid.

133. A method as recited in Claim 131, wherein said liquid solution comprises yttrium nitrate.

134. A method as recited in Claim 131, wherein said phosphor particles further comprise Eu.

135. A method as recited in Claim 131, wherein said liquid solution comprises europium nitrate.

136. A method as recited in Claim 131, wherein said liquid solution comprises from about 5 to 10 weight percent precursors.

137. A method as recited in Claim 131, wherein said pyrolyzing step comprises pyrolyzing said droplets at a reaction temperature of from about 850°C to about 1000°C.

138. A method as recited in Claim 131, wherein said pyrolyzing step comprises pyrolyzing said droplets at a reaction temperature of from about 900°C to about 950°C.

139. A method as recited in Claim 131, wherein said intermediate precursor particles have an average particle size of not greater than about 5 μm.

140. A method as recited in Claim 131, wherein said heating step comprises

heating said intermediate precursor particles to a temperature of from about 1350°C to about 1500°C.

141. A method as recited in Claim 131, wherein said heating step comprises heating said intermediate precursor particles in an oxygen-containing gas.

142. A method as recited in Claim 131, wherein said heating step comprises heating said intermediate precursor particles in air.

143. A method as recited in Claim 131, wherein said heating step comprises the step of heating said intermediate compound while applying sufficient agitation to substantially prevent the formation of hard agglomerates.

144. A method as recited in Claim 131, wherein said heating step comprises heating said intermediate precursor particles in a rotary kiln.

145. A method as recited in Claim 131, wherein said phosphor particles have a weight average particle size of not greater than about 5 μm.

146. A method for the production of a $BaMgAl_XO_Y$ phosphor powder batch, comprising the steps of:

a) forming a liquid comprising precursors to a $BaMgAl_XO_Y$ phosphor compound;

b) generating an aerosol of droplets from said liquid;

c) pyrolyzing said droplets to remove liquid therefrom and at least partially react said precursors to form intermediate precursor particles; and

d) heating said intermediate precursor particles to form a powder batch of phosphor particles.

147. A method as recited in Claim 146, wherein said step of generating an aerosol comprises the step of ultrasonically atomizing said liquid.

148. A method as recited in Claim 146, wherein said liquid comprises particulate alumina.

149. A method as recited in Claim 146, wherein said liquid comprises excess alumina.

150. A method as recited in Claim 146, wherein said liquid comprises at least about 20 atomic percent excess alumina.

151. A method as recited in Claim 146, wherein said liquid comprises barium nitrate.

152. A method as recited in Claim 146, wherein said liquid comprises magnesium nitrate.

153. A method as recited in Claim 146, wherein said phosphor particles further comprise a dopant selected from the group consisting of Eu and Mn.

154. A method as recited in Claim 153, wherein said liquid comprises a precursor selected from the group consisting of europium nitrate and manganese nitrate.

155. A method as recited in Claim 146, wherein said liquid comprises from about 5 to 10 weight percent precursors.

156. A method as recited in Claim 146, wherein said intermediate precursor particles have an average size of not greater than about 5 μm.

157. A method as recited in Claim 146, wherein said pyrolyzing step comprises

pyrolyzing said droplets at a reaction temperature of from about 750°C to about 950°C.

158. A method as recited in Claim 146, wherein said heating step comprise heating said intermediate precursor particles to a temperature of from about 1200°C to about 1650°C.

159. A method as recited in Claim 146, wherein said heating step comprises heating said intermediate precursor particles in a reducing gas composition.

160. A method as recited in Claim 146, wherein said heating step comprises a first heating step wherein said intermediate phosphor particles are heated in air at a temperature of from about 1200°C to about 1600°C to crystallize the $BaMgAl_XO_Y$ phase and a second heating step comprising heating in a hydrogen-containing atmosphere at a temperature of from about 1400°C to about 1650°C to reduce Eu^{3+} to Eu^{2+}.

161. A method as recited in Claim 146, wherein said heating step comprises the step of heating said intermediate precursor particles while applying sufficient agitation to substantially prevent the formation of hard agglomerates.

162. A method as recited in Claim 146, wherein said heating step comprises the step of heating in a rotary kiln.

163. A method as recited in Claim 146, wherein said phosphor particles have a weight average particle size of not greater than about 5 μm.

164. A method for the production of a $BaAl_XO_Y$ phosphor powder batch, comprising the steps of:

a) forming a liquid comprising precursors to a $BaAl_XO_Y$ phosphor compound;

b) generating an aerosol of droplets from said liquid;

c) pyrolyzing said droplets to remove liquid therefrom and at least partially react said precursors to form intermediate precursor particles; and

d) heating said intermediate precursor particles to form a powder batch of phosphor particles.

165. A method as recited in Claim 164, wherein said step of generating an aerosol comprises the step of ultrasonically atomizing said liquid.

166. A method as recited in Claim 164, wherein said liquid comprises particulate alumina.

167. A method as recited in Claim 164, wherein said liquid comprises excess alumina.

168. A method as recited in Claim 164, wherein said liquid comprises at least about 20 atomic percent excess alumina.

169. A method as recited in Claim 164, wherein said liquid comprises barium nitrate.

170. A method as recited in Claim 164, wherein said phosphor particles further comprise Mn as a dopant.

171. A method as recited in Claim 164, wherein said liquid comprises a manganese nitrate precursor.

172. A method as recited in Claim 164, wherein said liquid comprises from about 6 to 10 weight percent precursors.

173. A method as recited in Claim 164, wherein said intermediate precursor particles have an average size of not greater than about 5 μm.

174. A method as recited in Claim 164, wherein said pyrolyzing step comprises pyrolyzing said droplets at a reaction temperature of from about 750°C to about 950°C.

175. A method as recited in Claim 164, wherein said heating step comprise

heating said intermediate precursor particles to a temperature of from about 1300°C to about 1600°C.

176. A method as recited in Claim 164, wherein said heating step comprises the step of heating said intermediate compound while applying sufficient agitation to substantially prevent the formation of hard agglomerates.

177. A method as recited in Claim 164, wherein said heating step comprises the step of heating in a rotary kiln.

178. A method as recited in Claim 164, wherein said phosphor particles have a weight average particle size of not greater than about 5 μm.

179. A method for the production of a Zn_2SiO_4 phosphor powder batch, comprising the steps of:

a) forming a liquid comprising precursors to a Zn_2SiO_4 phosphor compound;

b) generating an aerosol of droplets from said liquid;

c) pyrolyzing said droplets to remove liquid therefrom and at least partially react said precursors to form intermediate precursor particles; and

d) heating said intermediate precursor particles to form a powder batch of phosphor particles.

180. A method as recited in Claim 179, wherein said step of generating an aerosol comprises the step of ultrasonically atomizing said liquid.

181. A method as recited in Claim 179, wherein said liquid comprises particulate silica.

182. A method as recited in Claim 179, wherein said liquid comprises excess silica.

183. A method as recited in Claim 179, wherein said liquid comprises at least about 10 atomic percent excess silica.

184. A method as recited in Claim 179, wherein said phosphor particles further comprise Mn.

185. A method as recited in Claim 184, wherein said liquid comprises manganese nitrate.

186. A method as recited in Claim 179, wherein said liquid comprises zinc nitrate.

187. A method as recited in Claim 179, wherein said pyrolyzing step comprises pyrolyzing said droplets at a reaction temperature of from about 900°C to about 950°C.

188. A method as recited in Claim 179, wherein said intermediate precursor particles have an average particle size of not greater than about 5 μm.

189. A method as recited in Claim 179, wherein said heating step comprises heating said intermediate precursor particles to a temperature of from about 1100°C to about 1200°C.

190. A method as recited in Claim 179, wherein said heating step comprises

heating said intermediate precursor particles in contact with a reducing gas composition.

191. A method as recited in Claim 179, wherein said heating step comprises the step of heating said intermediate compound while applying sufficient agitation to substantially prevent the formation of hard agglomerates.

192. A method as recited in Claim 179, wherein said heating step comprises the step of heating in a rotary kiln.

193. A method as recited in Claim 179, wherein said phosphor particles have an average particle size of not greater than about 5 μm.

194. A method for the production of a $(Y,Gd)BO_3$ phosphor powder batch, comprising the steps of:

a) forming a liquid comprising precursors to a $(Y,Gd)BO_3$ phosphor compound;

b) generating an aerosol of droplets from said liquid;

c) pyrolyzing said droplets to remove liquid therefrom and at least partially react said precursors to form intermediate precursor particles; and

d) heating said intermediate precursor particles to form a powder batch of phosphor particles.

195. A method as recited in Claim 194, wherein said step of generating an aerosol comprises the step of ultrasonically atomizing said liquid.

196. A method as recited in Claim 194, wherein said liquid comprises boric acid.

197. A method as recited in Claim 194, wherein said liquid comprises an excess of boric acid.

198. A method as recited in Claim 194, wherein said phosphor particles comprise Eu.

199. A method as recited in Claim 198, wherein said liquid comprises europium nitrate.

200. A method as recited in Claim 194, wherein said pyrolyzing step comprises pyrolyzing said droplets at a reaction temperature of from about 900°C to about 950°C.

201. A method as recited in Claim 194, wherein said heating step comprises heating said intermediate precursor particles to a temperature of from about 1300°C to about 1400°C.

202. A method as recited in Claim 194, wherein said heating step comprises heating said intermediate precursor particles in air.

203. A method as recited in Claim 194, wherein said heating step comprises the step of heating said intermediate precursor particles while applying sufficient agitation to substantially prevent the formation of hard agglomerates.

204. A method as recited in Claim 194, wherein said heating step comprises the step of heating said intermediate precursor particles in a rotary kiln.

205. A method as recited in Claim 194, wherein said phosphor particles have an average particle size of not greater than about 5 μm.